

REMARKS

Reconsideration of this application, as amended, is respectfully requested.

In this response, claim 3 has been amended. Claims 1 and 2 have been canceled. Claims 5-7 have been added. Support for the amendments is found in the specification, the drawings, and in the claims as originally filed. Applicants submit that the amendments do not add new matter.

Applicants reserve all rights with respect to the applicability of the Doctrine of Equivalents.

Claims 1-3 stand rejected under 35 U.S.C. §112, first paragraph.

Applicants have canceled claims 1 and 2.

Applicants have amended claim 3 to read, in part, as follows: "wherein the powders are insulated and coated and then compacted at a pressure of 10 tons/cm²-18 tons/cm²."

The specification discloses the following:

The High Flux or MPP powder is produced using a spray process, heat treated at 800-900 C for 8 hours in a mixed gas atmosphere of hydrogen and nitrogen. The heat-treated powder is subjected to an insulation coating process employing 0.5-3. 0 wt% of mixed ceramic. The mixed ceramic contains magnesium hydroxide, kaoline, talc, and water glass (sodium silicate) mixed with each other.

As for silicon steel powder having excellent DC bias characteristics, as disclosed in Korean Pat. Application No. 2000-4180 which has been made by the applicant of the present invention, Fe and Si are melted so that a molten mixture contains 6.5 % Si and the balance of Fe, and sprayed using a mixed gas, which includes one or more gases selected from the group consisting of N₂, He, Ne, Ar, Xe, and Rn gases, to produce powder. The powder is heat treated at 800-900 C for 8 hours in an atmosphere of hydrogen, nitrogen, or a mixed gas of hydrogen and nitrogen. Subsequently, powder having a particle size of 80 mesh (175 n) or less is selected, and then subjected to a wet-insulation coating process employing 0.5-2. 0 wt% of mixed ceramic, or subjected to a dry-insulation coating process employing a glass frit to create the silicon steel powder for the block.

(specification, page 6, lines 17-35)(emphasis added)

Further, the specification discloses the following:

At this stage, a unit block having a length of 6 cm, a width of 3 cm, and a height of 2 cm is compacted at a high compacting pressure of 100-500 tons (10 - 18 tons per unit area [cm²]). Next, the compacted unit core is heat treated at 650-750 C for 1 hour in a nitrogen atmosphere so as to remove residual stress and strain, thereby completing the production of the unit block for the core.

(specification, page 7, lines 10-15)(emphasis added)

Therefore, applicants respectfully submit “wherein the powders are insulated and coated and then compacted at a pressure of 10 tons/cm²-18 tons/cm²” are supported by the specification, and the Examiner’s rejection of claim 3, as amended, under 35 U.S.C. 112, first paragraph, should be withdrawn.

Claims 1-3 stand rejected under 35 U.S.C. §112, second paragraph.

Applicants have canceled claims 1-2. The Examiner stated that “the meaning of the limitations ‘compacted by an insulation coating and/or at a pressure’ is not clear.”(Office Action, p. 3)

Amended claim 3 reads, in part “wherein the powders are insulated and coated and then compacted at a pressure of 10 tons/cm²-18 tons/cm². ” (emphasis added).

Therefore, applicants respectfully submit that the Examiner’s rejection of claim 3, as amended, under 35 U.S.C. §112, second paragraph, has been overcome.

Claims 1 and 2 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the U.S. Patent No. 5,651,841 to Moro et al. (“Moro”).

Applicants have canceled claims 1-2.

Claims 1 and 2 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,470,399 to Bae (“Bae”).

Applicants have canceled claims 1-2.

Amended claim 3 reads as follows:

A core, which employs unit blocks made of soft magnetic metal powders and which has excellent high-current DC bias characteristics, comprising:

the unit blocks for the core, which are produced using one or more powders selected from the group consisting of High Flux powder, MPP powder, and silicon steel powder, produced by a spray process, and which each have a length of 3 - 10 cm, a width of 1 - 5 cm, and a height of 1 - 5 cm, wherein the powders are insulated and coated and then compacted at a pressure of 10 tons/cm²-18 tons/cm² and heat treated at 600⁰C-800⁰C for 1-2 hours in an inert gas,

wherein the unit blocks are attached to each other using a heat and fire resistant epoxy or polyurethane adhesive to form a single-phase reactor or a three- phase reactor.

(Amended claim 3)(emphasis added)

The support for limitations of amended claim 3 including “wherein the powders are insulated and coated and then compacted at a pressure of 10 tons/cm²-18 tons/cm² and heat treated at 600⁰C-800⁰C for 1-2 hours in an inert gas” can be found in the specification of the present application (page 5, lines 23-27). The unit block formed at a pressure of 10 tons -18 tons per unit area (cm²) is heat treated at 600⁰C-800⁰C for 1-2 hours in an inert gas atmosphere. The above temperature and time are limited in order to desirably remove the residual stress of the unit block in the course of forming the unit block in a non-oxidizing atmosphere.” (specification, page 5, lines 23-27).

The specification of the present application discusses employing a soft magnetic metal powder to produce a unit block of a hexahedral shape and that is 3-10 cm long, 1-5 cm wide, and 1-5 cm high. Furthermore, the unit block is formed at a compacting pressure of 10-18 tons per unit area (cm²) to maintain the shape of the unit block (specification, page 5, lines 4-19).

In contrast, a conventional treatment method produces a problem of tearing an edge in the preparation of the unit block, and thus has many technical difficulties in preparing the unit block.

Claim 3 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Moro and Bae, and further in view of JP 04-165607 to (“Japan’607”).

Moro discloses a powder magnetic core. More specifically, Moro discloses that the “dried mixture was then pressed into a toroidal body having an outer diameter of 17.5 mm, an inner diameter of 10.2 mm and a height of 6 mm. In this case, the mixture was pressed at a pressure of 10 t/cm.^{sup.2} for 10 seconds.” (col. 11, lines 1-4).

Thus, Moro discloses forming a toroidal body at a pressure of 10 t/cm² for 10 seconds. In contrast, amended claim 1 refers to each of the unit blocks formed at a pressure of 10 tons/cm²-18 tons/cm² and heat treated at 600⁰C-800⁰C for 1-2 hours in an inert gas and having a length of 3 - 10 cm, a width of 1 - 5 cm, and a height of 1 - 5 cm.

Bae discloses making MPP core using the powder. More specifically, Bae discloses forming a core with a forming pressure of 240,000psi. (col. 7, lines 34-39). In contrast, amended claim 3 refers to each of the unit blocks formed at a pressure of 10 tons/cm²-18 tons/cm² and heat treated at 600⁰C-800⁰C for 1-2 hours in an inert gas and having a length of 3 - 10 cm, a width of 1 - 5 cm, and a height of 1 - 5 cm.

Japan’607, in contrast, discloses a core for static induction electric device. Japan’607 fails to disclose each of the unit blocks formed at a pressure of 10 tons/cm²-18 tons/cm² and heat treated at 600⁰C-800⁰C for 1-2 hours in an inert gas and having a length of 3 - 10 cm, a width of 1 - 5 cm, and a height of 1 - 5 cm.

It is respectfully submitted that none of the references cited by the Examiner teach or suggest a combination with each other. It would be impermissible hindsight, based on applicants’ own disclosure, to combine these references.

Furthermore, even if Moro, Bae, and Japan’607 were combined, such a combination would still lack each of the unit blocks formed at a pressure of 10 tons/cm²-18 tons/cm² and heat

treated at 600°C - 800°C for 1-2 hours in an inert gas and having a length of 3 - 10 cm, a width of 1 - 5 cm, and a height of 1 - 5 cm, as recited in amended claim 3.

Therefore, applicant respectfully submits that claim 3, as amended, is not obvious under 35 U.S.C. §103(a) over Moro and Bae and further in view of Japan'607.

Given that new claims 5-7 depend from amended claim 3, and add additional limitations, applicants respectfully submit that claims 5-7 are not obvious under 35 U.S.C. §103(a) over Moro and Bae and further in view of Japan'607.

In view of the above discussion, it is respectfully submitted that even if the cited references were combined, such a combination would still lack each of the unit blocks formed at a pressure of 10 tons/cm²-18 tons/cm² and heat treated at 600°C - 800°C for 1-2 hours in an inert gas and having a length of 3 - 10 cm, a width of 1 - 5 cm, and a height of 1 - 5 cm, and wherein each of the unit blocks has a hexahedral shape, as recited in new claim 5.

In view of the above discussion, it is respectfully submitted that even if the cited references were combined, such a combination would still lack each of the unit blocks formed at a pressure of 10 tons/cm²-18 tons/cm² and heat treated at 600°C - 800°C for 1-2 hours in an inert gas and having a length of 3 - 10 cm, a width of 1 - 5 cm, and a height of 1 - 5 cm, and wherein each of the unit blocks has a residual stress removed, as recited in new claim 6.

In view of the above discussion, it is respectfully submitted that even if the cited references were combined, such a combination would still lack each of the unit blocks formed at a pressure of 10 tons/cm²-18 tons/cm² and heat treated at 600°C - 800°C for 1-2 hours in an inert gas and having a length of 3 - 10 cm, a width of 1 - 5 cm, and a height of 1 - 5 cm, and a bracket on the unit blocks to endure vibration and impact, as recited in new claim 7.

It is respectfully submitted that in view of the amendments and arguments set forth herein, the applicable rejections and objections have been overcome. If the Examiner believes a telephone conference would expedite the prosecution of the present application, the Examiner is invited to call the undersigned at (408) 720-8300.

If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

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